FTP-A

	HARDWARE POINTS				SOFTWARE POINTS		FUEL OIL ALARM PANEL
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
FUEL OIL PUMP A STATUS			X				X
FUEL OIL PUMP B STATUS			X				X
FUEL OIL PUMP A START/STOP				X			X
FUEL OIL PUMP B START/STOP				X			X
FUEL OIL PUMP A FAILURE					X	X	X
FUEL OIL PUMP B FAILURE					X	X	X
FUEL OIL PUMP A RUNNING IN HAND			X			X	X
FUEL OIL PUMP B RUNNING IN HAND			X			X	X
FLOW SWITCH PUMP A			X				X
FLOW SWITCH PUMP B			X				X
DIFFERENTIAL PRESSURE SWITCH	X						X
LEAK DETECTOR			X			X	X
STRAINER DIRTY			X			X	X
LEAD PUMP				X			X
LAG PUMP				X			X
PUMP A RUNTIME					X		X
PUMP B RUNTIME					X		X
POWER SOURCE A			X				X
POWER SOURCE B			X				X
GENERATOR RUNNING			X				X
EMERGENCY STOP				X			X
PLC-A FAILURE					X	X	X
PLC-B FAILURE					X	X	X
PLC-A SWITCH			X				X
PLC-B SWITCH			X				X
TOTALS	1		13	5	6	8	25
HARDWARE TOTALS	19						

2

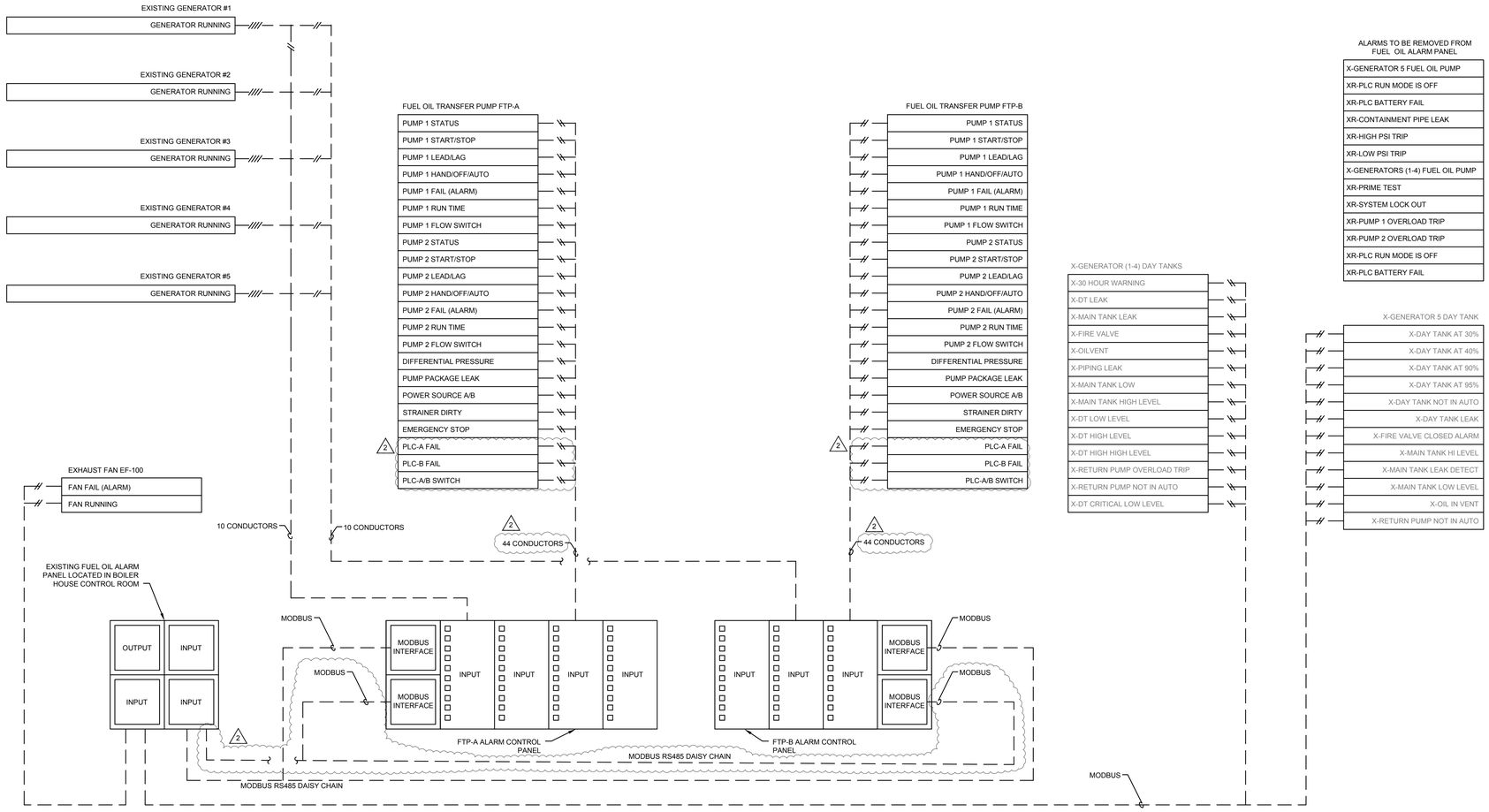
FTP-B

	HARDWARE POINTS				SOFTWARE POINTS		FUEL OIL ALARM PANEL
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
FUEL OIL PUMP A STATUS			X				X
FUEL OIL PUMP B STATUS			X				X
FUEL OIL PUMP A START/STOP				X			X
FUEL OIL PUMP B START/STOP				X			X
FUEL OIL PUMP A FAILURE					X	X	X
FUEL OIL PUMP B FAILURE					X	X	X
FUEL OIL PUMP A RUNNING IN HAND			X			X	X
FUEL OIL PUMP B RUNNING IN HAND			X			X	X
FLOW SWITCH PUMP A			X				X
FLOW SWITCH PUMP B			X				X
DIFFERENTIAL PRESSURE SWITCH	X						X
LEAK DETECTOR			X			X	X
STRAINER DIRTY			X			X	X
LEAD PUMP				X			X
LAG PUMP				X			X
PUMP A RUNTIME					X		X
PUMP B RUNTIME					X		X
POWER SOURCE A			X				X
POWER SOURCE B			X				X
GENERATOR RUNNING			X				X
EMERGENCY STOP				X			X
PLC-A FAILURE					X	X	X
PLC-B FAILURE					X	X	X
PLC-A SWITCH			X				X
PLC-B SWITCH			X				X
TOTALS	1		13	5	6	8	25
HARDWARE TOTALS	19						

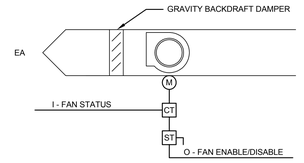
2

EF-100

	HARDWARE POINTS				SOFTWARE POINTS		FUEL OIL ALARM PANEL
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
FAN STATUS			X				X
FAN FAILURE						X	X
TOTALS			1			1	2
HARDWARE TOTALS	1						



SEQUENCE OF OPERATION FOR "EF-100"



FAN OPERATION
1. THE FAN SHALL OPERATE CONTINUOUSLY.
2. FUEL OIL ALARM PANEL SHALL MONITOR CURRENT SENSING RELAY AND GENERATE ALARM IF FAN IS NOT RUNNING.
3. TIE FAN ALARM INTO THE EXISTING FUEL OIL ALARM PANEL LOCATED IN THE BOILER CONTROL ROOM. PROVIDE WIRING AND PROGRAMMING FOR EACH ALARM POINT.

SCALE = NTS

ALARM NOTES:

1. CONTRACTOR SHALL PROVIDE, TERMINATE, AND TEST ALL ALARMS AND CONTROL WIRING BETWEEN THE NEW TRANSFER PUMP CONTROL PANELS, NEW TRANSFER PUMPS, EXISTING GENERATORS AND EXISTING ALARM PANEL CONTROLS.
2. CONTRACTOR SHALL PROVIDE ALL REQUIRED CONTROL WIRING BETWEEN DEVICES.
3. CONTRACTOR SHALL TIE INTO TRANSFER PUMP CONTROL PANEL TO DISPLAY STATUS POINTS AND GENERATE ALARMS LISTED IN POINTS LIST.
4. CONTRACTOR SHALL TIE INTO THE EXISTING GENERATORS FOR LISTED POINTS/ALARMS.
5. POINTS LISTED ARE NEW ADDITIONAL POINTS ALL EXISTING POINTS NOT SHOWN ARE TO REMAIN.
6. CONTRACTOR SHALL HIRE A SUBCONTRACTOR EXPERIENCED WITH THE EXISTING ALARM PANEL TO COMPLETE WIRE CONNECTIONS AND PROGRAMMING.
7. CONTRACTOR SHALL PROVIDE EXHAUST FAN CONTROLLER AND MONITOR STATUS AND ALARM IF FAN IS NOT RUNNING.

GENERATOR MECHANICAL SEQUENCE OF OPERATIONS

SEQUENCE OF OPERATIONS:

EXISTING SEQUENCE (TO REMAIN, WITH THE FOLLOWING ADDITIONS):

1. TRANSFER PUMPS (BOTH FTP-A AND FTP-B) SHALL BE CONTROLLED TO AUTOMATICALLY ALTERNATE LEAD/LAG PUMPS TO PROVIDE EVEN RUNTIME.
2. FOR GENERATOR #5 BOTH SOLENOID VALVES WILL BE CONTROLLED BY THE FLOAT CONTROLS.
3. TRANSFER PUMPS (BOTH FTP-A AND FTP-B) SHALL BE CONTROLLED TO AUTOMATICALLY RUN WHEN EVER A GENERATOR IS RUNNING.
4. TRANSFER PUMPS (BOTH FTP-A AND FTP-B) SHALL SHUT OFF 15 MINUTES AFTER THE GENERATORS HAVE SHUT DOWN.

FUEL OIL ALARM PANEL:

A. SCOPE OF WORK FOR EXISTING FUEL OIL ALARM PANEL
2 1. PROVIDE TWO NEW MODBUS RS-485 DAISY CHAIN TO EACH OF TWO NEW DUPLEX FUEL OIL PUMP SET CONTROL PANELS.
2. WIRE FAN STATUS, PROVIDE WIRING FROM NEW EXHAUST FAN TO ALARM PANEL.
3. PROGRAM TEXT, GRAPHICS, AND SEQUENCE FOR EACH POINT LISTED.
4. ADD MEMORY AND CARDS OR MODULES NECESSARY TO ACCOMMODATE THE ADDITIONAL POINTS.

B. ALL LISTED ALARMS SHALL BE PROGRAMMED AND WIRED BACK TO EXISTING ALARM PANEL LOCATED IN THE BOILER PLANT CONTROL ROOM.

C. ALL FUEL OIL ALARM PANEL WIRE TERMINATION AND PROGRAMMING TO BE COMPLETED BY A CONTROLS CONTRACTOR FAMILIAR WITH THE EXISTING ALARM SYSTEM AND WITH EXPERTISE IN CRITICAL ALARM SYSTEMS SUCH AS; SYSTEMS GROUP TECHNOLOGIES, MIKE YAMMINE (MYAMMINE@SYSTEMSGROUPTECH.COM) (567) 208-4334.

GENERAL OVERVIEW OF GENERATOR FUEL OIL SYSTEM OPERATION:

THERE ARE FIVE EMERGENCY GENERATORS. FOUR (GENERATORS 1-4) ARE GROUPED TOGETHER IN A GENERATOR ROOM ABOVE THE ENERGY CENTER TUNNEL AND ONE (GENERATOR 5) IS LOCATED IN A ROOM ON THE NORTHWEST CORNER OF THE ENERGY CENTER. GENERATORS 1-4 HAVE TWO DAY TANKS EACH DT-A AND DT-B. GENERATOR 5 HAS A SINGLE DAY TANK. THE REVISED PIPING WILL PROVIDE TWO INDEPENDENT FUEL OIL LOOPS TO EACH GENERATOR. WHEN ANY OF THE FIVE GENERATORS STARTS BOTH FUEL OIL TRANSFER PUMPS WILL START AND CIRCULATE FUEL THROUGH BOTH LOOP A AND LOOP B. EACH GENERATOR WILL DRAW FUEL FROM ITS DAY TANK(S). EACH DAY TANK CONTAINS A FLOAT. WHEN THE DAY TANK FLOAT DROPS TO ITS FILL LEVEL THE DAY TANK CONTROLLER WILL OPEN A SOLENOID VALVE AND ALLOW THE DAY TANK TO FILL WITH FUEL. GENERATOR 5 HAS A SINGLE DAY TANK, THEREFORE ITS LEVEL CONTROLLER WILL OPEN BOTH SOLENOIDS ONE FROM LOOP A AND ONE FROM LOOP B. AS THE DAY TANK FILLS, THE FLOAT WILL RISE TO ITS FILL STOP LEVEL AND CLOSE THE SOLENOID VALVE. AFTER ALL FIVE GENERATORS HAVE SHUT DOWN THE PUMPS SHALL RUN FOR AN ADDITIONAL 15 MINUTES AND THEN SHUT DOWN. ALARMS SHALL BE DISPLAYED ON THE FUEL OIL ALARM PANEL LOCATED IN THE BOILER HOUSE CONTROL ROOM. A SIX-WAY VALVE ALLOWS FTP-B TO DRAW FUEL FROM EITHER STORAGE TANK #1 OR STORAGE TANK #6. THE SIX-WAY CONTROL VALVE CONTROL PANEL IS LOCATED IN THE FUEL OIL VAULT.

FULLY SPRINKLERED

ADDENDUM 02 (2)	09/20/16
ADDENDUM 01	09/01/16
Final Issue	08/22/16
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16031

ARCHITECT:

Drawing Title: **FUEL OIL ALARM DIAGRAM**

Approved:

Project Title: **MODIFY EMERGENCY FUEL OIL PUMP**

Location: **VAMC - WADE PARK**

Date: 08/22/16 | Checked: DAD | Drawn: DAD

Project Number: 541-16-502

Building Number:

Drawing Number: **1-M5.0**

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